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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>29 August 2005</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-40</u> is/are pending in the application.

  4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-40</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>14 November 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

  a)☐ All b)☐ Some * c)☐ None of:

  1.☐ Certified copies of the priority documents have been received.

  2.☐ Certified copies of the priority documents have been received in Application No. _____.

  3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
  Paper No(s)/Mail Date <u>11/14/03;8/29/05</u>.

4)☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1.   The two information disclosure statements (IDS) submitted on 14 November

2003 and 29 August 2005 were fully considered by the examiner.

Drawings

2.   The drawings were received on 14 November 2003. These drawings are

deemed acceptable for examination.

Specification

3.   The specification is objected to as failing to provide proper antecedent basis for

the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction

of the following is required:

The computer readable media as recited in claims 38 and 39 is not supported in

the original disclosure.

4.   The lengthy specification has not been checked to the extent necessary to

determine the presence of all possible minor errors. Applicant's cooperation is

requested in correcting any errors of which applicant may become aware in the

specification.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5.   Claims 1-16 and 40 are rejected under 35 U.S.C. 101 because they are directed to non-statutory subject matter.

As for claims 1-16, the multiple "modules" recited defining the apparatus in these claims may, according to Applicant's original specification, comprise executable code alone according to paragraph 0034, all lines (e.g. software *per se*).

As for claim 40, Applicant evokes §112 sixth paragraph through the recitation of a series of "means for" steps, which, according to Applicant's original specification, may be specifically carried out solely in software (e.g. software *per se* – see paragraphs 0034, and 0056 of the original specification).

Claims to software *per se* do not fit into one of the four statutory categories of invention; hence the claims are held to be non-statutory.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6.   Claims 1-16, 21-24, 29-32 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitation "the application policy attributes" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim. More specifically, application policy attributes are not previously set forth in this claim or the claim from which it depends. The claim will be further treated on its merits assuming "the application policy attributes" refers to any application policy attributes.

Claim 6 recites the limitation "the predefined copy policy attributes" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim. More specifically, only one predefined copy policy attribute is previously set forth in this claim. The claim will be further treated on its merits assuming "the application policy attributes" refers solely to "a predefined copy policy attribute" referenced on line 2 of this claim.

As for claim 6, the phrase "the differences between the copy function attributes and the predefined copy policy attributes are the smallest" renders the claim indefinite. More specifically, one of ordinary skill in the art would be unable determine exactly what constitutes the smallest difference between a copy function attribute and the predefined copy policy attributes in light of Applicant's original specification (size of attribute, type of attribute, etc.). Examiner will further treat the claim on its merits based on the assumption that said copy function will be selected based on a copy function that is most *similar* to the predefined copy policy attribute.

As for claim 7, the phrase "multiples each attribute by a priority factor" renders the claim indefinite. More specifically, one of ordinary skill in the art would be unable determine how an attribute can be "multiplied by a priority factor" in light of Applicant's original specification. Is the attribute mathematically multiplied by a factor? If so, how

can a scalar value be multiplied by an attribute? Examiner will further treat the claim on its merits based on the assumption that the attributes are prioritized. A similar rejection applies to claim 8 with the phrase "multiple each difference by a priority factor". Examiner assumes for the purposes of applying art that the differences between the predefine copy policy attribute and copy function attribute are prioritized based on their respective similarities.

Claims 13-16, 21-24, and 29-32 are rejected based on the same rationale as claims 5-8.

As for claims 1-16 and 40, the multiple "modules" recited defining the apparatus in claims 1-16, and the "means for" steps recited in claim 40 may, according to Applicant's original specification, comprise executable code alone according to paragraph 0034, all lines. As such, the categorization of these claims as being an "apparatus" renders them indefinite, as one of ordinary skill in the art would be unable to ascertain exactly how an "apparatus" may be defined strictly by a set of executable code alone.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7.   Claims 1, 2, 4-10, 12-18, 20-26 and 28-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Yanaka (US Patent 6,467,034 B1).

As for claim 1, Yanaka teaches an apparatus for automatically selecting a copy function, the apparatus comprising:

an identification module configured to identify available copy functions in response to a data copy request (the write activity detector monitors the write requests and identifies if the present mode (i.e. synchronous, semi-synchronous or adaptive – the three predefined copy policies) is appropriate for the data transfer – col. 7, lines 20-32);

a comparison module configured to compare each available copy function to a predefined copy policy (the write activity detector compares the present mode with the predefined modes to determine if the amount of activity required at that time can be efficiently serviced – col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11);

a selection module configured to automatically select a copy function that satisfies the predefined copy policy (the write activity detector issues a command to change the remote copy mode to another predefined mode that is most appropriate for the transfer – col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11); and

a relationship module configured to establish a copy relationship between the determined copy function and the data copy request (once the write activity detector issues the command to change the copy mode, the new mode is set for the transfer – again, col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11).

As for claim 9, Yanaka teaches an apparatus for automatically selecting a copy

function, the apparatus comprising:

a policy generation module configured to establish a copy policy

compatible with an application (the host issues commands which are

subsequently analyzed by the write activity detector to determine if the generated

copy policy is best suited for the application – col. 7, lines 20-42); and

a copy request module (Fig. 1, the activity detector (element 125) works in

conjunction with the host (element 100) and the remaining elements of the

controller (element 101) to perform the copy request) configured to:

recognize a data copy request that includes the copy policy (the write

activity detector recognizes the copy request and the mode of transfer (i.e.

synchronous, semi-synchronous or adaptive) – col. 7, lines 20-50) ;

identify available copy functions (the write activity detector monitors the

write requests and identifies if the present mode (i.e. synchronous, semi-

synchronous or adaptive – the three predefined copy policies) is appropriate for

the data transfer – col. 7, lines 20-32);

compare each copy function for a storage device to attributes of the copy

policy (the write activity detector compares the present mode with the predefined

modes to determine if the amount of activity required at that time can be

efficiently serviced – col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11);

automatically select a copy function that satisfies the copy policy (the write

activity detector issues a command to change the remote copy mode to another

predefined mode that is most appropriate for the transfer – col. 7, lines 25-36 and

col. 5, line 61 through col. 6, line 11); and

establish a copy relationship between the determined copy function and

the data copy request (once the write activity detector issues the command to

change the copy mode, the new mode is set for the transfer – again, col. 7, lines

25-36 and col. 5, line 61 through col. 6, line 11).

As for claim 17, Yanaka teaches a system for automatically selecting a copy

function, the system comprising:

an application module configured to send a data copy request (Fig. 1, host

A (element 100) - col. 5, lines 61-66);

an identification module configured to identify available copy functions in

response to a data copy request that includes a predefined copy policy (the write

activity detector monitors the write requests and identifies if the present mode

(i.e. synchronous, semi-synchronous or adaptive – the three predefined copy

policies) is appropriate for the data transfer – col. 7, lines 20-32);

a comparison module configured to compare each available copy function

to attributes of the predefined copy policy (the write activity detector compares

the present mode with the predefined modes to determine if the amount of

activity required at that time can be efficiently serviced – col. 7, lines 25-36 and

col. 5, line 61 through col. 6, line 11);

a selection module configured to automatically select a copy function that

satisfies the predefined copy policy (the write activity detector issues a command

to change the remote copy mode to another predefined mode that is most appropriate for the transfer – col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11);

a relationship module configured to establish a copy relationship between the determined copy function and the data copy request (once the write activity detector issues the command to change the copy mode, the new mode is set for the transfer – again, col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11);

a source storage module configured to store data from the application module (Fig. 1, disk A (element 111) – col. 6, line 47 through col. 7, line 6); and

a destination storage module configured to store data copied from the source storage module in response to the data copy request using the selected copy function (Fig. 2, disk B (element 211) – col. 7, lines 20-50).

Claims 25, 33, 38 and 40 recite a method, method, computer readable medium, and apparatus respectively which are similar in scope to claim 1, therefore these claims are rejected based on the same rationale as claim 1, as per the rejection *supra*.

As for claim 2, Yanaka teaches a policy generation module configured to read a set of required attributes from an application and to establish the predefined copy policy based on the set of required attributes from the application (the write activity detector bases its decision to change the mode based on attribute data from the host (i.e. number of commands, quantify of information, response time, access range, etc.) – col. 9, lines 8-36).

As for claim 4, Yanaka teaches the identification module as being further configured to determine a set of copy functions compatible with an application, determine a set of copy functions compatible with a source storage device and a destination storage device, and determine the available copy functions that are common to both the set of copy functions compatible with the application and the set of copy functions that are compatible with the source storage device and the destination storage device (all three modes are compatible with the application, source storage device, and destination storage device. The write activity detector determines the best mode for most efficient mirroring based on system requirements at the time – col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11).

As for claim 5, Yanaka teaches the selection module as being further configured to compare a predefined copy policy attribute to a copy function attribute for each of a group of available copy functions and to select a copy function with the largest number of attributes that satisfy the application policy attributes (the write activity detector will select a copy function that is most efficient based on the attributes (i.e. number of commands, quantify of information, response time, access range, etc.) of the application – col. 9, lines 8-36).

As for claim 6, Yanaka teaches the selection module as being further configured to calculate a difference between a predefined copy policy attribute and a copy function attribute for each of the available copy functions and to select a copy function where the differences between the copy function attributes and the predefined copy policy attributes are the smallest (the mode is determined based on the outcome of a weighted

sum to establish a mode most similar to the one required for maximizing mirroring efficiency – col. 9, lines 10-36).

As for claim 7, Yanaka teaches the selection module as being further configured to compare a predefined copy policy attribute to a copy function attribute for each of the available copy functions, to multiply each attribute by a priority factor, and to select a copy function with a highest score (the mode is established by multiplying a correlation coefficient by the number of commands fitting in an access range, effectively prioritizing which mode is most efficient for the mirroring; if the upper limit is exceeded, the mode is changed appropriately – col. 9, lines 10-36) .

As for claim 8, Yanaka teaches the selection module as further configured to calculate a difference between a predefined copy policy attribute and a copy function attribute for each of the available copy functions, to multiply each difference by a priority factor, and to select a copy function with a highest score (the mode is established by a weighted sum of values by multiplying a correlation coefficient by the number of commands fitting in an access range, effectively prioritizing which mode is most efficient for the mirroring; if the upper limit is exceeded, the mode is changed appropriately – col. 9, lines 10-36).

As for claim 34, Yanaka teaches identifying available copy functions in response to a data request that are compatible with an application, a source storage device, and a destination storage device (all three modes are compatible with the application, source storage device, and destination storage device. The write activity detector

determines the best mode for most efficient mirroring based on system requirements at

the time – col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11).

As for claim 35, Yanaka teaches establishing a copy relationship between the

determined copy function and a data copy request (once the write activity detector

issues the command to change the copy mode, the new mode is set for the transfer –

again, col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11).

Claims 10, 12-16, 18, 20-24, 26 and 28-32 are similar in scope to claims 2 and 4-

8; therefore they are rejected based on the same rationale as claims 2 and 4-8.

Claims 36, 37 and 39 are similar in scope to claims 2, 3 and 4 respectively;

therefore they are rejected based on the same rationale as claims 2, 3 and 4

respectively.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

8.   Claims 3, 11, 19 and 27 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Yanaka (US Patent 6,467,034 B1) as applied to claims 1, 9, 17 and

25 respectively above, and in further view of Yamagami (US PG Publication

2002/0143999 A1).

As for claim 3, though Yanaka teaches a policy generation module configured to determine the predefined copy policy based on a set of required attributes from an application (as per the rejection of claim 2 above), he fails to specifically teach allowing a user to determine the policy.

Yamagami however teaches path selection method for storage based remote copy in which a user is capable of selecting a copy policy based on system attributes (paragraph 0006, all lines).

It would have been obvious to one of ordinary skill in the art at the time of the invention for Yanaka to further include Yamagami's path selection method into his own data mirroring method. By doing so, Yanaka could minimize the cost of data transfer in his system via user-selectable multiple network connections as taught by Yanaka in paragraphs 0004 through 0005, all lines.

Claims 11, 19 and 27 are similar in scope to claim 3; therefore they are rejected based on the same rationale as claim 3.

Conclusion

9.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:
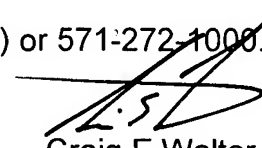
Ashton et al. (US PG Publication 2003/0140204 A1) teach an instant virtual copy technique with expedited creation of backup dataset inventory from source dataset inventory.

Jouenne et al. (US Patent 6,286,085 B1) teach a system for backing up data synchronously and asynchronously depending on a pre-established criterion.

10.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig E. Walter whose telephone number is (571) 272-8154. The examiner can normally be reached on 8:30a - 5:00p M-F.

11.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung Sough can be reached on (571) 272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

12.   Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Craig E Walter
Examiner
Art Unit 2188

CEW

HYUNG SOUGH
SUPERVISORY PATENT EXAMINER

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